ABSTRACT OF THE DISCLOSURE

A stress of a c-axis-oriented specimen of a tetragonal polycrystal is measured using X-ray diffraction under the assumption of a plane stress state. An X-ray optical system is set in the location of $\phi = 0°$, $45°$ or $90°$. An X-ray diffracted at a crystal plane (the direction of the normal thereto is the direction of an angle of ψ) with the Miller indices (hkl) is detected. A diffraction angle θ in a strain state is measured in the vicinity of a Bragg's angle θ_0 in a non-strain state. Strains ε with respect to a plurality of ψ are calculated from the difference between the measurement values θ and the Bragg's angle θ_0. Specific stress calculation formulae are determined with respect to the tetragonal system having the Laue symmetry 4/mmm. The stress is calculated from the slope of the linear line of plotted measurement results.